

WHAT IS CLAIMED IS:

1. A substrate for forming electron source in which an electron emission device is disposed comprising:

5 a substrate containing Na;

10 a first layer containing SiO<sub>2</sub> as a main component formed directly or indirectly on said substrate; and  
a second layer containing electron conductive oxide formed directly or indirectly on said substrate.

102 2. The substrate for forming electron source according to claim 1, wherein said first layer is formed on said substrate (containing Na), and said second layer is formed on the first layer.

15 3. The substrate for forming electron source according to claim 2, wherein said second layer contains SiO<sub>2</sub> as its ingredient.

20 4. The substrate for forming electron source according to claim 2, wherein said first layer contains at least one kind of element to be selected from an element group comprising P, B, and Ge.

25 5. The substrate for forming electron source according to claim 3, wherein said first layer contains at least one kind of element to be selected from an

element group comprising P, B, and Ge.

6. The substrate for forming electron source according to claim 1, wherein said second layer is  
5 formed on said substrate containing Na, and said first layer is formed on the second layer.

7. The substrate for forming electron source according to claim 6, wherein said second layer  
10 contains SiO<sub>2</sub> as its ingredient.

8. The substrate for forming electron source according to claim 6, wherein said first layer contains at least one kind of element to be selected from an  
15 element group comprising P, B, and Ge.

9. The substrate for forming electron source according to claim 7, wherein said first layer contains at least one kind of element to be selected from an  
20 element group comprising P, B, and Ge.

10. The substrate for forming electron source according to any of claims 1 through 9, wherein said electron emission device comprises:

25 a conductive film having an electron emission portion which is disposed on said first or second layer; and

a pair of electrodes connected with the conductive film.

11. An electron source comprising:

5 a substrate according to any one of claims 1 through 9; and

an electron emission device disposed on said first layer or said second layer of the substrate.

10 12. An electron source comprising:

a substrate according to any one of claims 1 through 9; and

a plurality of electron emission devices disposed on said first layer or said second layer of the  
15 substrate.

13. An electron source comprising:

a substrate according to any one of claims 1 through 9; and

20 a plurality of electron emission devices disposed on said first layer or said second layer of the substrate; and

25 a plurality of row direction wirings and a plurality of column direction wirings in which the plurality of electron emission devices are matrix-wired.

14. The electron source according to claim 11,  
wherein said electron emission device comprises:

a conductive film having an electron emission  
portion which is disposed on said first or second  
layer; and

5 a pair of electrodes connected with the conductive  
film.

10 15. The electron source according to claim 12,  
wherein said electron emission device comprises:

a conductive film having an electron emission  
portion which is disposed on said first or second  
layer; and

15 a pair of electrodes connected with the conductive  
film.

20 16. The electron source according to claim 13,  
wherein said electron emission device comprises:

a conductive film having an electron emission  
portion which is disposed on said first or second  
layer; and

25 a pair of electrodes connected with the conductive  
film.

17. An image forming apparatus comprising:  
an electron source according to claim 11; and  
an image forming member to form an image with

irradiation of electrons emitted from the electron source.

18. An image forming apparatus comprising:  
5 an electron source according to claim 12; and  
an image forming member to form an image with  
irradiation of electrons emitted from the electron  
source.

10 19. An image forming apparatus comprising:  
an electron source according to claim 13; and  
an image forming member to form an image with  
irradiation of electrons emitted from the electron  
source.

15 20. An image forming apparatus comprising:  
an electron source according to claim 14; and  
an image forming member to form an image with  
irradiation of electrons emitted from the electron  
source.

20 21. An image forming apparatus comprising:  
an electron source according to claim 15; and  
an image forming member to form an image with  
25 irradiation of electrons emitted from the electron  
source.

22. An image forming apparatus comprising:  
an electron source according to claim 16; and  
an image forming member to form an image with  
irradiation of electrons emitted from the electron  
source.

23. A manufacturing method of a substrate for  
forming electron source with which an electron emission  
device is formed, wherein a first layer with SiO<sub>2</sub> as its  
main component, and a second layer containing electron  
conductive oxide are formed on a substrate containing  
Na.

24. The manufacturing method of a substrate for  
forming electron source according to claim 23, wherein  
said first and second layers are formed with chemical  
film-forming method.

25. The manufacturing method of a substrate for  
forming electron source according to claim 23, wherein  
forming of said first and second layers comprises:

a process of forming film with CVD method by using  
organic silicon compound as material source; and  
a process of forming film with CVD method by using  
organic metal compound to form electron conductive  
oxide in addition to said organic silicon compound as  
material source.

26. The manufacturing method of a substrate for forming electron source according to claim 23, wherein forming of said first and second layers comprises:

- a process of forming a coat layer containing  
5 organic silicon compound;  
a process of forming a coat layer containing  
organic silicon compound and electron conductive oxide  
fine particles; and  
a process of heating said both coat layer.

10 27. A manufacturing method of an electron source comprising:

a process in which a first layer with  $\text{SiO}_2$  as its  
main component, and a second layer containing electron  
15 conductive oxide are formed on a substrate containing  
Na; and

a process of forming an electron emission device  
on said first layer or on said second layer.

20 28. The manufacturing method of an electron source according to claim 27, wherein said electron emission device is an electron emission device comprising carbon film, and the electron emission device is formed on a second layer containing oxide of  
25 at least one kind of element to be selected from In,  
Sn, Sb, and Re as said electron conductive oxide.

29. The manufacturing method of an electron source according to claim 27, wherein said electron emission device is an electron emission device comprising a carbon film, and said second layer is a 5 layer containing  $\text{SiO}_2$ , and the electron emission device is formed on the second layer.

30. The manufacturing method of an electron source according to claim 27, wherein said electron 10 emission device is an electron emission device comprising a carbon film, and the electron emission device is formed on the first layer with said  $\text{SiO}_2$  as a main component.

15       31. A manufacturing method of an image forming apparatus comprising:  
            an electron source, and  
            an image forming member to form an image with  
            irradiation of electrons emitted from the electron  
20       source,  
            wherein said electron source is manufactured by a  
method according to any one of claims 27 through 30.

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